## APPENDIX A

## Engineering Field Trip Report

# Fine Gold Reservoir

# APPENDIX A.1

# Study Team Field Trip Report

# (June 12, 2002)

# Field Trip Log

| | | | |
|---|---|---|---|
| **Trip Log Number:** | 9 | **Project No.:** | 1003032.01180502 |
| **Dates:** | 6/12/02 | **Times:** | ~1355-1425 |
| **Site Name:** | Fine Gold | **Location:** | Friant |
| **Prepared By:** | DKR/JMH/WAM | **Reviewed By:** | |
| **Date:** | 6/12/02 | **Date:** | |

| **Attendees/Visitors Name** | 1.1.1.1.1.1.1 Organization/Phone/Email |
|---|---|
| DKR | MWH, 925.685.6275 x125, david.k.rogers@ei.mwhglobal.com |
| JMH | MWH, 925.685.6275 x143, james.m.herbert@ei.mhwglobal.com |
| WAM | MWH, 425.602.4025 x1060, william.a.moler@ei.mwhglobal.com |
| William Swanson | MWHA |
| Stephen Osgood/Yung-Hsin | MWHA |
| Jason Phillips | USCOE |
| Bill Luce/Greg Mongano/ Joel Sturm | USBR |
| Clarence Duster/Gary Turlington/Steve Harrington | USBR |
| Waiman Yip | DWR |
| | USFG |

**Weather Conditions:**

Clear with slight haze, warm (80s), light breeze

**Access Route (attach map):**

Highway 99, State highway 145 (E) through Madera, to Friant Road (S), to Lake Millerton Boat Ramp. Fine Gold area accessed via Friant Rd (N) to Hildreth Rd (E), to Rd 216 (SE)

| **Attachments:** | Yes | No |
|---|---|---|
| Photo Log | ✔ | |
| Photos | ✔ | |
| Video Log (available) | ✔ | |
| Dictation Log (available) | ✔ | |
| Topographic Map | ✔ | |

**Purpose:**

Review proposed location of new damsite.

**Field Observations:**

1. Existing Structures/Cultural Features:

   None noted at damsite; however, residential development is located above right abutment area.

2. Right of Way/Access Restrictions:

   Roads lead into the Fine Gold area on the right bank. The only other access is via Millerton Lake.

3. Overhead/Buried Utilities:

   None noted at the damsite.

4. Description of Proposed Structures (attached a field sketch or sketch on a topo map):

   Unaware of specific recommendations made for this location.

5. Description of Appurtenant Features (spillways, tunnels, pumping plants, flood routing/coffer dams/dewatering during construction, outlet works, switch yards, transformer yards, transmission lines, conveyance pipelines/canals, access roads, security, operation/maintenance):

   URS recommended a 400-foot high RCC dam with a storage of ~350 TAF (URS, 2000).

   Madera Irrigation District (MID) has proposed two different storage configurations for Fine Gold. In 1988 & 1991 MID proposed, through Parsons, Brinkerhoff, Quaid, and Douglas (June 1988) and Wave Engineers (February 1991), a 350 TAF reservoir for offstream storage filled by pumps from a Lake Millerton. The pumps would be 400 mW reversible pumps/turbines.

   In 2001, MID proposed, through URS (May 2001) 50 TAF to 80 TAF reservoir fed by natural runoff and a gravity diversion from Willow Creek. No hydropower facilities were proposed.

6. Briefly Describe Geologic/Geotechnical Site Conditions:

   The Fine Gold damsite is located within the lower reaches of the Sierra Nevada foothills above the Great Valley. The Fine Gold damsite would be located across the generally south-flowing Fine Gold tributary to the San Joaquin River (CDMG, 1967).

   The State geologic map shows the right abutment as being underlain by pre-Cretaceous metamorphic and the left abutment by Mesozoic granitic rock (CDMG,

1967). However, observations made indicate that both abutments are underlain by metamorphic rocks with granitic intrusions and quartz dikes.

As with most sites in the region, studies indicate that there are no faults in the area capable of producing ground motions greater than those generated by four known regional sources that include the San Andreas fault system, the Sierra Frontal fault system, the White Wolf fault, and the Garlock fault (USCOE, 1990).

7. Location/Description of Nearest Borrow Areas (attach map or show on topo map):

   Borrow sites in close proximity were not noted, but may be present upstream in the Fine Gold drainage area.

8. Location/Description of Equipment/Material Staging and Lay Down Areas (attach map or show on topo map):

   Potential staging and laydown areas in proximity were not noted, but may be in areas presently submerged or upstream in the Fine Gold drainage area.

9. Identification of Environmental Sensitive Areas (wetlands, springs, rivers, streams, endangered/threatened species habitats, etc.):

   An oak woodland habitat covers the riverbank slopes.

10. Description of Mining or Other Anthropologic Activities:

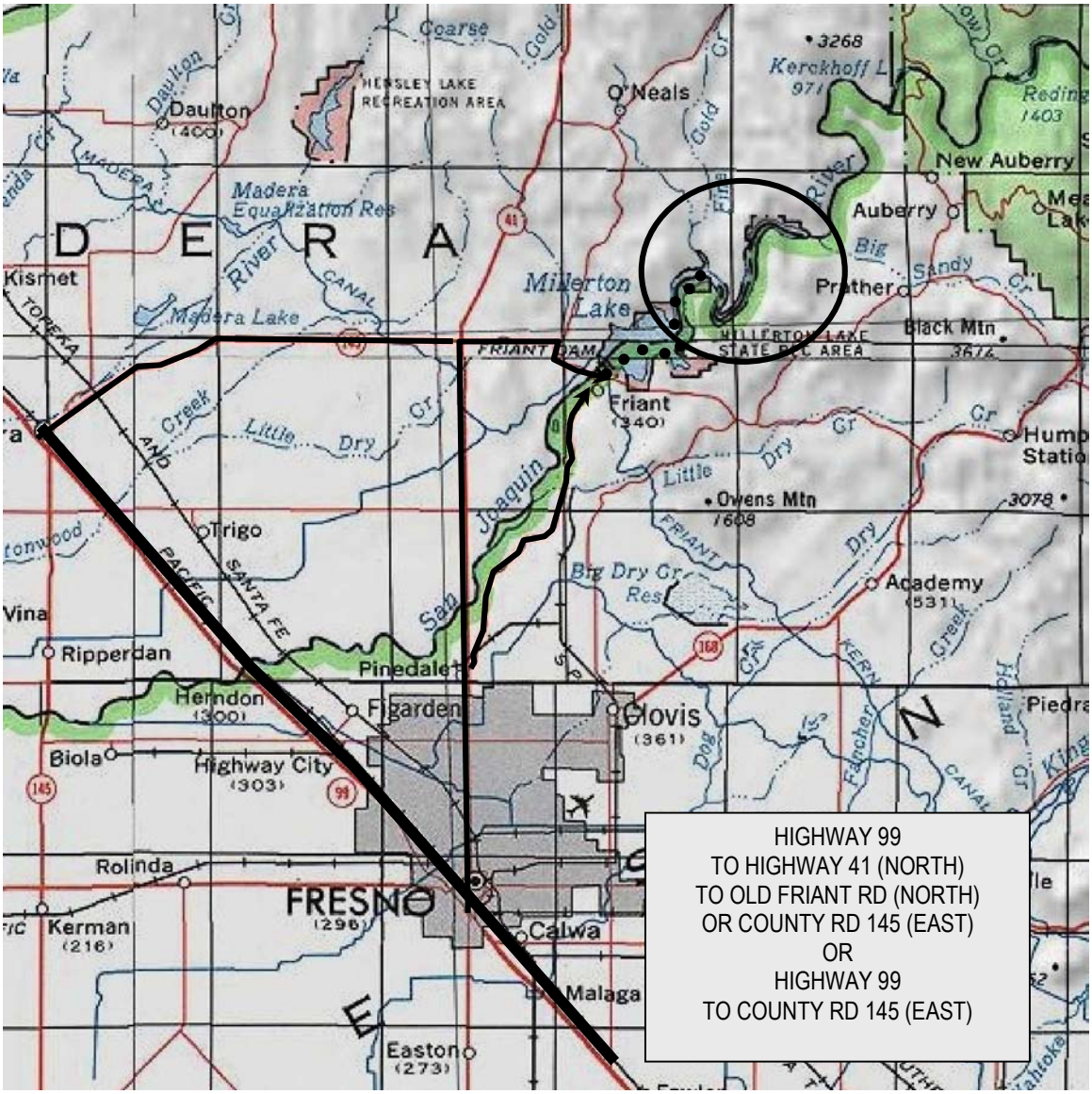
    None were noted.

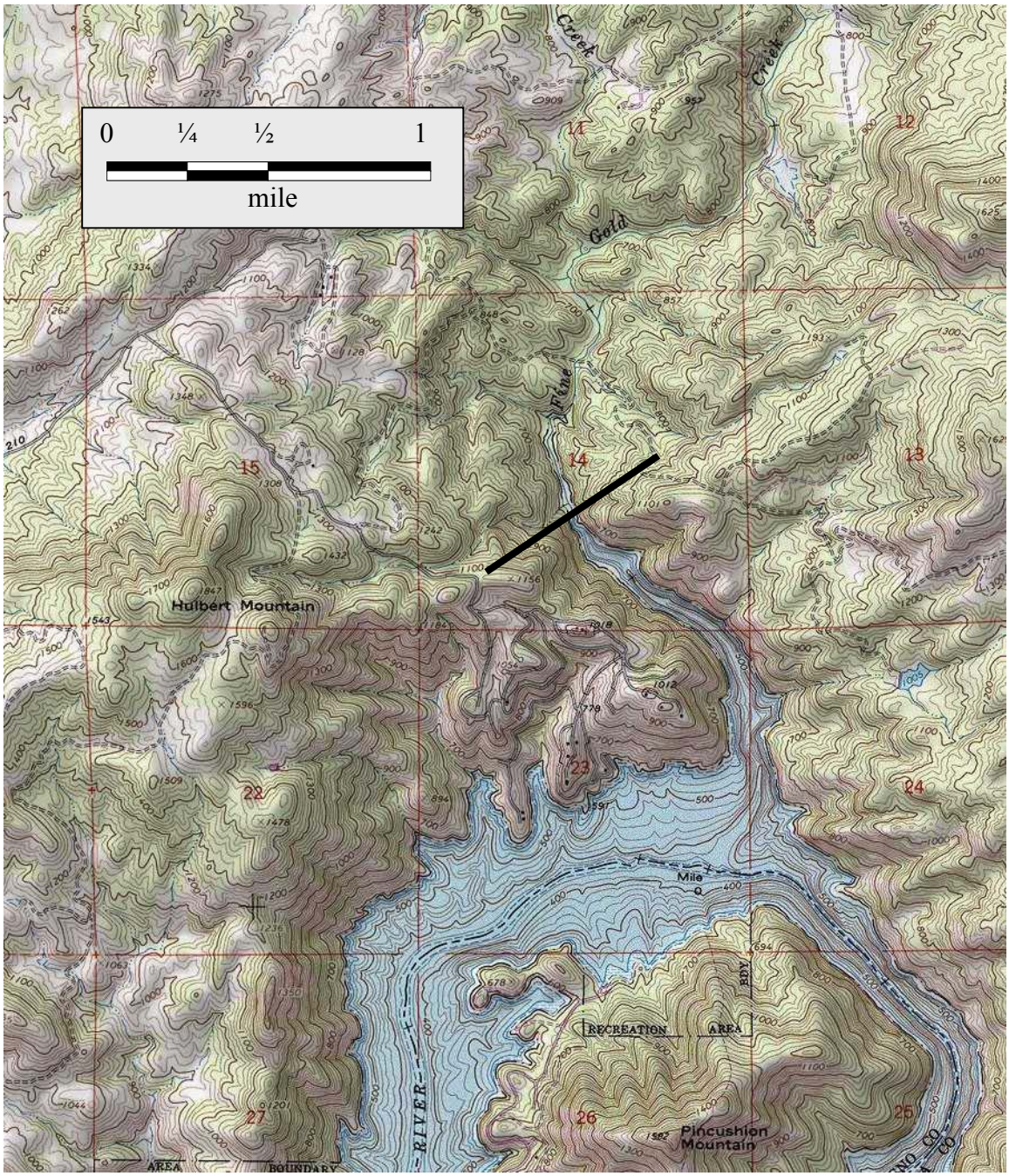
11. Action Items/Data Needs (list who has responsibility and schedule for completion):

    - USBR to prepare draft Technical Memorandum and regional seismicity / faulting by August 23, 2002.

12. Routing:

    - MWH-5
    - USBR-3
    - DWR-2


HIGHWAY 99
TO HIGHWAY 41 (NORTH)
TO OLD FRIANT RD (NORTH)
OR COUNTY RD 145 (EAST)
OR
HIGHWAY 99
TO COUNTY RD 145 (EAST)
Coarse Gold
Hensley Lake Recreation Area
Daulton
O'Neals
Kerckhoff L.
New Auberry
Auberry
Madera Equalization Res
Madera Lake
Millerton Lake
Millerton Lake State Rec Area
Friant Dam
Friant
Black Mtn
Kismet
Trigo
Owens Mtn
Academy
Big Dry Cr Res
Ripperdan
Pinedale
Herndon
Figarden
Clovis
Biola
Highway City
Rolinda
FRESNO
Kerman
Calwa
Malaga
Easton
Pacific Santa Fe
Friant-Kern Canal


0 ¼ ½ 1
mile
Fine Gold Creek
Hulbert Mountain
Pincushion Mountain
RECREATION AREA
RIVER
Mile 0
14
15
13
23
24
22
26
25
27

Fine Gold - Upstream view of Fine Gold Creek.

Upstream view of proposed right dam



Cross stream view of proposed left abutment.

## APPENDIX A.2

# USBR Field Trip Report

# June 12-14, 2002

# Upper San Joaquin River Storage Investigation
## Field Trip Logs

## August 2002

**Prepared By U.S. Bureau of Reclamation**
**Mid-Pacific Regional Office - Sacramento, California and**
**Technical Service Center - Denver, Colorado**

Bureau of Reclamation personnel from the Mid-Pacific Region, Sacramento, California, and the Technical Services Center, Denver, Colorado prepared this report. This report contains three attachments as follows:

ATTACHMENT 1 - General Information and Field Trip Log for Fine Gold Damsite

ATTACHMENT 2 - Figure 2

ATTACHMENT 3 - Photographs 19 -28

Note: This page has been modified from the original provided by Reclamation to reflect the exclusion of materials pertaining specifically to Temperance Flat Damsite and Friant Dam Raise, which are contained in the appendices of their respective Technical Memoranda.

## ATTACHMENT 1 – GENERAL INFORMATION AND FIELD TRIP LOGS

### Site Review - Temperance Flat and Fine Gold Damsites, and Friant Dam Raise

**Reclamation Inspection Team**

| Name | Title | Location | Phone Number |
|---|---|---|---|
| Clarence Duster | Civil Engineer | Denver, CO | (303) 445-2993 |
| Gary Turlington | Geologist | Denver, CO | (303) 445-3203 |
| Steve Higinbotham | Civil Engineer | Denver, CO | (303) 445-2491 |
| Greg Mongano | Geologist | Sacramento, CA | (916) 978-5331 |
| Joel Sturm | Geologist | Sacramento, CA | (916) 978-5305 |

**Field Trip Itinerary**

**6/12:** The inspection team participated in a boat trip to the three Temperance Flat Damsites (MP 274, MP 279, and MP 280), Fine Gold Damsite and Millerton Lake. The boat, provided by California State Parks, carried 21 passengers from California DWR, Montgomery, Watson, Harza Engineers and Reclamation. The inspection team also inspected the crest of Friant Dam and traveled to Wishon Powerhouse (upstream end of Kerckhoff Lake), and Kerckhoff Powerhouses No. 1 and No. 2.

**6/13:** The inspection team drove to Temperance Flat and hiked to the left abutments of MP 279 Damsite and MP 280 Damsite (located about 1 mi. upstream of MP 279 Damsite) and drove to Fine Gold Recreation area (located about 1 mi. downstream of MP 274 Damsite) via Sky Harbor Dr.

**6/14:** The inspection team drove to the upper right abutment of Fine Gold Damsite and drove through the Fine Gold Reservoir area via Road 210. The team briefly stopped at the Vulcan aggregate pit and plant located in the San Joaquin River channel, about 1 mi. downstream of Friant Dam.

**Weather Conditions**

Warm to hot and clear. Daily highs in the mid- to upper-90s.

**Friant Reservoir (Millerton Lake) Conditions on June 12, 2002**

Water Surface: El. 573.8 (Max water surface: El. 580)
Reservoir Volume: 501,022 acre-feet (Max capacity: 520,000 a-f)
Inflow: 2,901 cubic feet per second (cfs)

## General Right of Way/Access Restrictions

The majority of the travel during the June 12-14, 2002 field trip was on paved or well maintained dirt public roads and trails. All roads traveled were passable to two-wheel drive vehicles. The use of private roads and crossing of private property was only required to access the two Kerckhoff Powerplants. Information on specific private roads, access restrictions and owner contacts is described separately in the Access Route section for each feature. Future fieldwork will require that formal requests for Right of Entry (ROE) be made.

## General Comments on Materials/Aggregate Suppliers

The inspection team briefly visited one aggregate processing operation, Vulcan aggregate pit and plant located in the San Joaquin River channel, about 1 mi. downstream of Friant Dam. Based on discussions with the operator, the following information on local sand and gravel processing operations are provided:

The Vulcan pit has 2 to 3 years of materials remaining under current permitting. Application for new permits that would allow deeper (35 feet) excavation has been submitted. Without approval of the new permits, Vulcan could cease operations in 2 to 3 years. Several sand and gravel operations in the Fresno area have ceased operation the past two years due to permit restrictions. Vulcan knows of only one operation in the area that crushes rock to make concrete aggregate.

## Miscellaneous Contacts

| Name | Agency | Title | Location | Phone Number |
|---|---|---|---|---|
| Gerry Pretzer | USBR | Operator | Friant Dam | (559) 822-2211 |
| Tony Buelna | USBR | Sup.Civil Eng. | Fresno, CA | (559) 487-5117 |
| Bob Epperson | USBR | Realty Spec. | Fresno, CA | (559) 487-5408 |
| Paul Linderman | PG&E | Hydraulic Struct. | Auberry, CA | (559) 855-6007 |
| Ted Jackson | CA State Parks | Dist. Super. | Millerton Lake | (559) 822-2332 |
| Kevin Forester | CA State Parks | Chief Ranger | Millerton Lake | (559) 822-2332 |
| Tom Christensen | Millerton Marina | Manager | Millerton Lake Marina | (559) 822-2264 |
| Dave Johnson | BLM | Ranger | Kerckhoff No. 2 | |

MWH
MONTGOMERY WATSON HARZA

MWH ENERGY & INFRASTRUCTURE, INC.

# Field Trip Log

| | | | |
|---|---|---|---|
| **Trip Log Number:** | | **Project No.:** | |
| **Dates:** | June 12-14, 2002 | **Times:** | |
| **Site Name:** | Fine Gold Creek | **Location:** | |
| **Prepared By:** | U. S. Bureau of Reclamation | **Reviewed By:** | |
| **Date:** | June 15, 2002 | **Date:** | |

| Attendees/Visitors Name | Organization/Phone/Email | |
|---|---|---|
| Clarence Duster, Civil Engineer | TSC, Denver, CO | 303-445-2993 |
| Steve Higinbotham, Civil Engineer | TSC, Denver, CO | 303-445-2491 |
| Gary Turlington, Geologist | TSC, Denver, CO | 303-445-3203 |
| Greg Mongano, Geologist | MP Region, Sacramento, CA | 916-978-5331 |
| Joel Sturm, Geologist | MP Region, Sacramento, CA | 916-978-5305 |

**Weather Conditions:**

Warm to hot and clear. Daily highs in the mid to upper 90s.

**Access Route (attach map):** **See map – Attachment 2, Figure 1**

**Site Access - Right Abutment**

- From Hwy 99, exit at Hwy 41 North
- 8 mi. north on Hwy 41 to Friant Rd. exit
- 12 mi. northeast on Friant Rd. to North Fork Rd.
- Left (east) on North Fork Road, cross San Joaquin River, 2 mi. northwest to Road 206
- Right (north) on Road 206, 5 mi. northeast to Road 210 (Road 206 becomes Road 211 after it passes Road 145)
- Right (east) on Road 210, 2.5 miles to Hidden Lake Estates Road (intersection between Roads 211 and 210 is marked Bellview on the topographic map)
- Right (southeast) on Hidden Lake Estates Road, 1.5 mi. to right abutment overlook at mailboxes. Hidden Lake Estates Rd. runs past several private residences located in the community of Hidden Lake Estates.

**Site Access - Left Abutment**

The left abutment was not accessed. Based on topographic maps, access appears to be as follows:

- From Road 211/Road 210 Intersection (Bellview), 3.5 mi. northeast on Road 210, past Hidden Lake Estates Road to Private Dirt Road.
- Right (southeast) on Private Dirt Road (ownership unknown), 1.5 mi. to upper left abutment. Road crosses Fine Gold Creek approx. 1 mi. southeast of Road 210. Condition of crossing and road unknown.

**Reservoir Area Access**

- From Road 211/Road 210 Intersection (Bellview), 5.5 mi. northeast on Road 210, past

Hidden Lake Estates Road, to Fine Gold Creek (gravel ford). Road 210 is a well-maintained dirt road beyond Hidden Lake Estates Rd. that is passable with two-wheel drive vehicles. Fine Gold Creek was easily crossed on June 14, 2002.

- 1 mi. northeast on Road 210 to sharp turn to northwest
- 2 mi. northwest to Fine Gold Creek bridge
- 3 mi. west to Road 200
- Left (west) on Road 200, 2 mi. west to Hwy 41
- Left (southwest) on Hwy 41, 8 mi. south-southwest to Road 145
- Left (east) on Road 145, 3.5 mi east to North Fork Road
- Right (south) on North Fork Road, 2 mi. south-southeast to Friant Rd. (Friant Dam).

| **Attachments:** | Yes | No |
|---|---|---|
| Photo Log | | X |
| Photos | X | |
| Video Log (available) | | X |
| Dictation Log (available) | | X |
| Topographic Map | X | |

**Purpose:**

Review of site conditions to consider appropriate dam and appurtenant structure locations and types, potential impacts related to the construction at the site, and design data requirements for the Phase 1 studies.

**Field Observations:**

1. Existing Structures/Cultural Features:

   No existing structures or facilities are located along the proposed alignments of the dam and appurtenant structures up to at least elevation 1100 feet. Residential areas exist above and downstream of the right abutment area. The Fine Gold Creek arm of Millerton Lake is present at the site with a normal reservoir level up to about elevation 578.

   The reservoir area contains scattered residential structures below the proposed maximum reservoir elevation of 1100.

2. Right of Way/Access Restrictions:

   See **Attachment 1 – General Information**

3. Overhead/Buried Utilities:

   No utilities are present in the damsite area. Types and locations of utilities serving

elevation 578

**Concrete Gravity Dam** - The concrete gravity dam option would have a similar alignment as the rock fill dam, see Attachment 2, Figure 2. The gravity dam would likely be constructed using RCC. For a dam crest of 1100 feet, an earth or concrete gravity section extending about 1200 feet horizontally along a flat area (saddle) of the left abutment is required.

Diversion for this concept may include routing the flows through the construction site until a low-level outlet structure is installed near the base of the dam. A downstream cofferdam may be necessary, depending on required operation of Friant Dam (Millerton Lake) during construction. The top of active conservation storage in Millerton Lake is elevation 578.

5. Description of Appurtenant Features (spillways, tunnels, pumping plants, flood routing/coffer dams/dewatering during construction, outlet works, switch yards, transformer yards, transmission lines, conveyance pipelines/canals, access roads, security, operation/maintenance):

**Embankment (Rockfill) Dam** - The spillway option for a rock fill dam would be to construct a concrete free-flow overflow section on the left abutment, with an excavated channel that connects to an existing natural drainage. Construction of gravity walls may be required along a section of the right side of the channel to reduce the amount of rock excavation.

The outlet would be constructed by tunneling through the abutments. An alternative might be to develop a notched ledge along the side of the abutment that is encased in reinforced concrete to match the profile of the abutment.

**Concrete Arch Dam** - There appear to be two spillway options for the arch dam. An ungated overflow flip bucket section through the center of the dam would be suitable if a reasonable plunge pool could be developed in combination with a sound foundation. If this is not practical, a notch through the left abutment and a channel to an existing drainage could be excavated through the rock. The spillway flows are not expected to be significant, but will need to be determined.

The outlets for the arch dam option consist of the pump/turbine system for this off site storage facility. Additional outlets may need to be provided to ensure adequate evacuation capability. The pump/turbine units could be located on the right abutment about 1000 feet downstream from the dam.

**Concrete Gravity Dam** - The spillway for the concrete gravity section would consist of an uncontrolled ogee crest with a stair-stepped slope and guide walls on the downstream side of the dam.

The outlet works for the concrete gravity structure would be similar to the arch dam option.

6. Briefly Describe Geologic/Geotechnical Site Conditions:

**Upper San Joaquin River Study**

General Area Geologic/Geotechnical Conditions - The dam sites associated with the Upper San Joaquin River Study include 1) the existing Friant Dam, 2) four potential damsites on the Upper Sam Joaquin River (MP 274, MP 279, MP 280, and Kerckhoff), and 3) an offstream dam site (Fine Gold) on the Fine Gold Creek drainage. These damsites are located along the western border of the central portion of the Sierra Nevada province at its boundary with the eastern edge of the Great Valley province of California. Friant Dam is founded on metamorphic rocks consisting of quartz biotite schist, intruded by aplite and pegmatite dikes and by inclusions of dioritic rocks. The contact of these metamorphic rocks with the Sierra Nevada batholith lies just east of the dam in Millerton Reservoir. The Sierra Nevada batholith is comprised of primarily intrusive rocks, including granite and granodiorite, with some metamorphosed granite including granite gneiss. The intrusive rocks underlie most of Millerton Reservoir and the MP 274, MP 279, MP 280, Kerckhoff, and Fine Gold dam sites. Occasional remnants of lava flows and layered tuff are present in the reservoir area at the highest elevations.

The central Sierra Nevada has a complex history of uplift and erosion. The most recent uplift tilted the western flank of the Sierra Nevada to the west. At the western border, rocks of the Sierra Nevada are overlapped by alluvium and sedimentary rocks of the Great Valley Province. The metamorphic rocks in the Friant Dam area dip steeply downstream to the west, and strike northwesterly. Erosion has resulted in thin alluvial cover.

**Fine Gold Site**

The Fine Gold Site rises steeply from elevation 520 in the Fine Gold Creek channel to about elevation 800 on the right abutment, and then more gradually to elevation 1160, before continuing through a series of saddles to elevation 1847 at Hulbert Mountain (Figure 2 and Photographs 19 through 23). The left abutment rises steeply from the Fine Gold Creek channel to elevation 650, and then continues more gradually to elevation 1101. The abutment then continues to rise through a series of saddles and hilltops until reaching Crook Mountain at elevation 2006. The Fine Gold Site is named after Fine Gold Creek.

Both abutments and the channel section are granite, with alluvium occurring in the channel section. A granite or pegmatite dike trends upslope on the left abutment. Where exposed at the surface in the bottom of drainages, along the reservoir rim, and in the left abutment dike, the granite is typically hard to very hard. Away from these exposures, the upper one to ten feet of the granite is intensely weathered to decomposed and soft to very soft. This material represents a weathered, in-place, soil-like profile at the ground surface. Hard erosion-resistant granite outcrops are scattered on the abutment slopes

above elevation 600. Some of these outcrops are detached blocks of rock up to 25 feet in maximum dimension.

Downstream of the proposed dam axis, the steep, water-scoured shoreline of the Fine Gold Creek arm of Millerton Lake exposes discontinuous zones of gray to brown foliated metamorphic rock included within the more widespread granitic rock. Light gray granitic dikes typically intrude the metamorphic rocks.

Alluvium of unknown thickness occurs below the reservoir water surface in the Fine Gold Creek channel. The alluvium probably ranges from fine to coarse grained, with rock blocks up to 25 feet in maximum dimension that detached from the abutment slopes.

Unstable wedges, toppling, or slides were not observed. The granite is adequate strength and stability for embankment, rockfill, concrete gravity, RCC, or concrete arch structures. The granite also is an adequate foundation for a plunge pool if an overflow section through the center of a concrete arch dam is considered.

7. Location/Description of Nearest Borrow Areas (attach map or show on topo map):

Based on observations during the field review, the following are anticipated sources for construction materials. Additional evaluation of materials is necessary to determine the adequacy, availability, and quantities of materials available in these and other sources.

Rock fill – Quarried from reservoir area

Earth fill – Limited quantities of low plasticity, fine-grained materials within reservoir area.

Processed sands and gravels – Commercial sources and/or crushing of quarried rock in reservoir area.

Concrete aggregate – Commercial sources and/or crushing of quarried rock in the reservoir area.

7. Location/Description of Equipment/Material Staging and Lay Down Areas (attach map or show on topo map):

The most likely location for construction use/staging/lay down areas is upstream of the damsite in the reservoir area.

8. Identification of Environmental Sensitive Areas (wetlands, springs, rivers, streams, endangered/threatened species habitats, etc.):

Fine Gold Creek and associated riparian habitat extends through the proposed reservoir

area. A detailed discussion of environmentally sensitive areas and environmental considerations for the Fine Gold site are presented in a separate report.

9. Description of Mining or Other Anthropologic Activities:

Historically, mining activities in the reservoir area are limited to placer operations, and gold mining in the area is no longer active.

10. Action Items/Data Needs (list who has responsibility and schedule for completion):

The following action item/data needs list shows the data requirements for appraisal level designs and cost estimates for the various dam and appurtenant structures options for the Fine Gold site.

The following action items apply to obtaining the required data for the Fine Gold site:

**Action Items/Data Needs**

| ITEM NO. | DESCRIPTION | RESPONSIBLE PARTY/COMPLETION |
|---|---|---|
| 1 | Finalize detailed topography (1"=200', 5' contours) | MP-200/ July 19, 2002 |
| 2 | Develop reservoir area-capacity for reservoir water surfaces up to El. 1100 | MP-200/ July 19, 2002 |
| 3 | Confirm bottom contours (underwater topography) at Fine Gold for a distance of about 1000 feet downstream of dam | MP-200, TSC/ August 9, 2002 |
| 4 | Prepare cross sections (profiles) on centerline at Fine Gold dam alignments | TSC/ July 19, 2002 |
| 5 | Obtain historical records of Friant Reservoir operations. | TSC/ July 19, 2002 |
| 6 | Obtain results of past Millerton Lake sediment surveys, in Fine Gold arm of reservoir (if available) | TSC/ July 19, 2002 |
| 7 | Develop Hydrologic Data | TSC/ |
| | PMF and Diversion Floods | August 9, 2002 |

| | | |
|---|---|---|
| 7 | Develop Hydrologic Data<br>PMF and Diversion Floods | TSC/<br>August 9, 2002 |
| 8 | Geologic conditions/mapping and materials investigations. Identify conditions that may preclude consideration of concrete arch dam | MP-200, TSC/<br>August 9, 2002 |
| 9 | Seismic/Seismotectonic Evaluation | TSC D-8330/<br>August 9, 2002 |
| 10 | Perform "house count" of residences or structures located in proposed reservoir | MP-200, TSC/<br>August 1, 2002 |

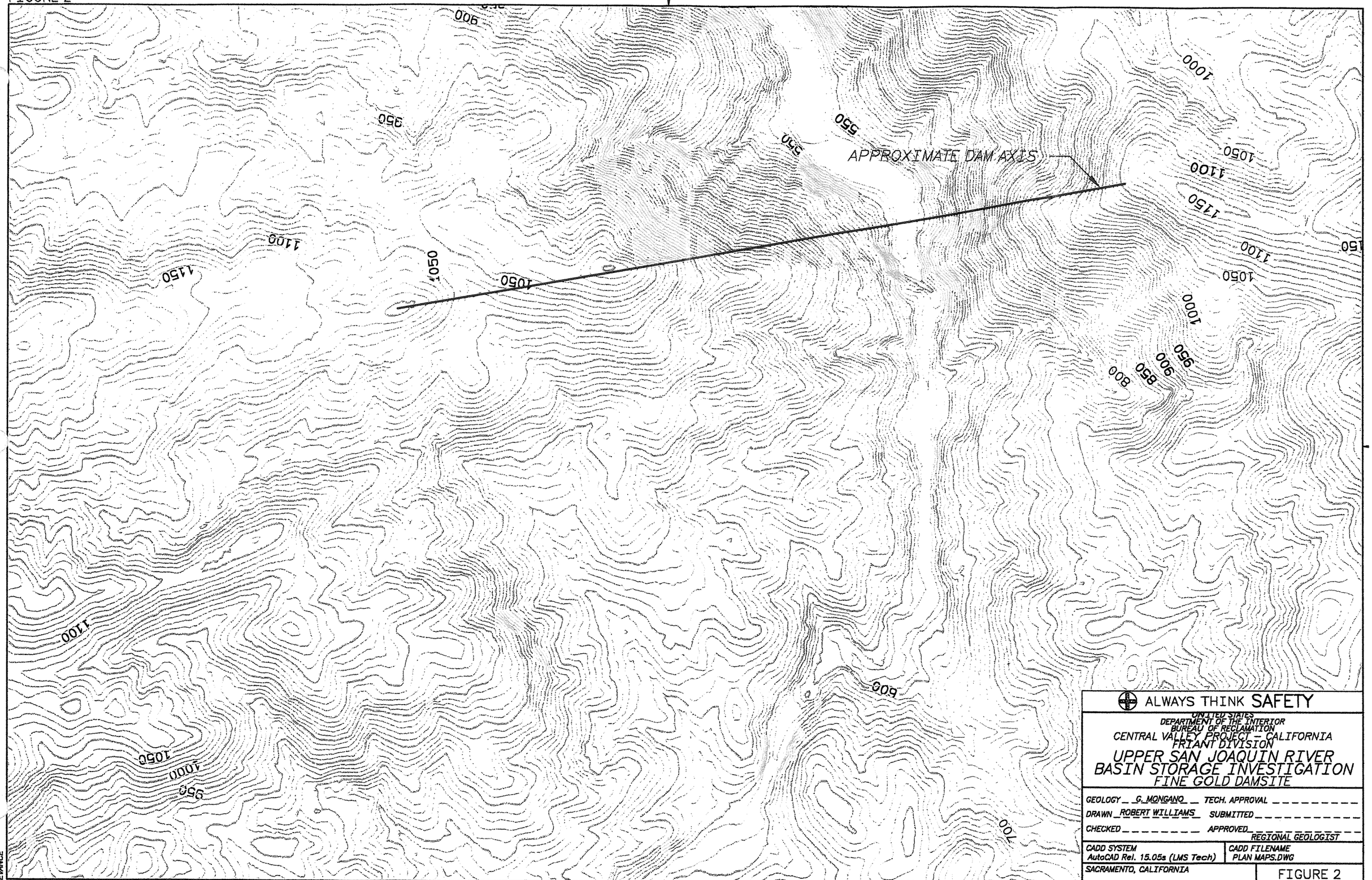
11. Routing:

MWH - 5
USBR - 5
DWR - 2

# ATTACHMENT 2

Figures

FIGURE 2




ALWAYS THINK SAFETY

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
CENTRAL VALLEY PROJECT – CALIFORNIA
FRIANT DIVISION

# UPPER SAN JOAQUIN RIVER BASIN STORAGE INVESTIGATION
## FINE GOLD DAMSITE

| | |
|---|---|
| GEOLOGY G. MONGANO | TECH. APPROVAL |
| DRAWN ROBERT WILLIAMS | SUBMITTED |
| CHECKED | APPROVED REGIONAL GEOLOGIST |
| CADD SYSTEM AutoCAD Rel. 15.05s (LMS Tech) | CADD FILENAME PLAN MAPS.DWG |
| SACRAMENTO, CALIFORNIA | FIGURE 2 |

AUGUST 5, 2002 09:04
PLOTTED BY EVANCE

Photo 19 Upper San Joaquin River Basin Storage Project

**FINE GOLD DAMSITE**

View upstream (north) of the Fine Gold Creek arm of Millerton Lake. Hidden Lake Estates is located immediately to the left of the photo. The damsite is located farther upstream where the abutments reach an elevation of El. 1100.

J. Sturm April 16, 2001

Photo 20 Upper San Joaquin River Basin Storage Project

**FINE GOLD DAMSITE**

View upstream (north) of the damsite. Outcrops and shoreline exposures are mostly hard, fresh granitic rock.

J. Sturm April 16, 2001

Photo 21 Upper San Joaquin River Basin Storage Project

**FINE GOLD DAMSITE**

View downstream (south) of the shoreline downstream of the right (west) abutment. The water-scoured shoreline exposes dark gray metamorphic rock intruded by white granitic dikes.

J. Sturm April 16, 2001

Photo 22 Upper San Joaquin River Basin Storage Project

**FINE GOLD DAMSITE**

View downstream (southwest) of the shoreline downstream of the left (east) abutment. The water-scoured shoreline exposes gray to brown metamorphic rock intruded by white granitic dikes.

J. Sturm April 16, 2001

Photo 24 Upper San Joaquin River Basin Storage Project

**FINE GOLD DAMSITE**

View downstream (south) of Fine Gold Creek from the Road 210 bridge located 1 mile west of Hildreth near the northern limit of the reservoir. The creek bottom exposes scoured granitic boulders and inplace rock. The water level in June 2002 was at least 2 feet lower than the April 2001 water level. A noticeable algae bloom was present in June 2002.

J. Sturm April 16, 2001

Photo 25 Upper San Joaquin River Basin Storage Project

**FINE GOLD DAMSITE**

View upstream (north of Fine Gold Creek from the Road 210 bridge. The creek bottom exposes scoured granitic rock. Granitic outcrops that are typical of the entire reservoir area are visible in the background.

J. Sturm April 16, 2001

Photo 26 Upper San Joaquin River Basin Storage Project

**FINE GOLD DAMSITE**

View to the east of a roadcut located about ½ mile northwest of Hildreth on the lower slopes of Hildreth Mtn. near the western margin of the reservoir. The roadcut exposes intensely weathered and decomposed granitic rock and a few hard, fresh corestones – a typical granitic weathering profile that is observed throughout the reservoir area.

J. Sturm April 16, 2001

Photo 27 Upper San Joaquin River Basin Storage Project

**FINE GOLD RESERVOIR**

Panoramic view to the southwest of the reservoir area. The highest peak in the background is Hulbert Mtn. (El. ).

J. Sturm April 17, 2001

Photo 28 Upper San Joaquin River Basin Storage Project

**KERCKHOFF POWERHOUSE NO. 2**

Panoramic view to the northeast of the San Joaquin River canyon from the road just south of Temperance Flat. Kerckhoff Powerhouse No. 1and a waste berm are visible at photo center. The waste berm is composed of "tunnel muck" (mostly granitic rock fragments) that was produced by the excavations for the underground powerhouse and access tunnels.

J. Sturm June 12, 2002